

# Traffic Safety Facts

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# Occupant Protection Issues Among Older Drivers and Passengers

## Background

The number of older adults in the United States is expected to grow dramatically. By the year 2030, adults 65 and older will make up nearly 20% of the U.S. population. Today, older people are healthier and living longer. This means that many older adults will keep their driver licenses longer and will drive more miles on the roadways than the current generation of older people; hence, they are at increased risk for involvement in motor vehicle crashes. Unless significant countermeasures are employed, traffic fatalities for older adults are projected to double or triple by the year 2030.

Although older adults are reported to use seat belts more often than any other age group, there is still a significant proportion of older adults who never use seat belts or use them only part-time. Much of what the National Highway Traffic Safety Administration knows about the reasons older adults do not use seat belts is anecdotal, including comfort and convenience issues, the presence of chronic health conditions such as arthritis, and resistance to seat belt use in general.

The overall purpose of this study was to understand what factors contribute to seat belt use and nonuse among adults age 65 and older. In addition, the study was designed to identify what can be done to increase seat belt use among older adults now and in the future, thereby reducing injuries and fatalities among the older adult population.

## Method

In order to fully comprehend the dynamics behind the decision to use or not use a seat belt and the factors that may influence seat belt use among seniors, the following activities were implemented:

1. A literature review, discussions with experts, and analyses using selected databases;
2. Fifteen focus groups conducted in four States (Florida, Iowa, Maryland, and Massachusetts) with older adults who were part-time users or nonusers of seat belts;
3. A human factors study in which 54 older adults were exposed to seat belt systems in three different vehicle models to measure the likelihood of use and to obtain ratings on comfort and convenience.

## Key Findings

The literature review and data analysis revealed that a variety of factors influence one's decision to use or not use a seat belt, including risk perception, road type, trip length, weather, presence of other vehicle occupants, comfort and convenience, and physical and health conditions. Major factors contributing to nonuse of seat belts among older adults are comfort and convenience. Some of the common issues mentioned by older adults related to comfort and convenience include difficulty reaching for the shoulder belt and pulling it across the body, the shoulder belt cutting across the neck, and difficulty inserting the latch plate into the belt buckle. These problems may be exacerbated by the different types of physical limitations experienced by older adults due to aging, such as arthritis, osteoporosis, obesity, and recovery from recent chest or abdominal surgery.

During the focus group discussions, several themes emerged similar to those found in the literature review. Most participants spoke of the discomfort associated with twisting and turning to reach for and buckle the seat belt. Heavier participants mentioned the tightness when secured, while shorter-stature participants complained about the shoulder belt chafing, choking, or rubbing across the neck. Many participants also mentioned problems with actually inserting the latch into the buckle portion of the seat belt. Some had difficulties locating the buckle and releasing the latch from the buckle.

During the focus groups, various aftermarket devices (seat cushions, pivoting seats, seat belt adjusters, shoulder pads, belt extenders, and plastic loops) designed to increase comfort and usability of seat belts were presented. The shoulder pad, belt extender, and plastic loop received extremely positive feedback; thus, these were incorporated into the field data collection study.

The final stage of the project was a human factors study that provided detailed observation and measurement of seat belt use and acceptability. Fifty-four older adults were exposed to six different safety belt systems and gave ratings regarding comfort, convenience, and likelihood of use. They tested each of the three test vehicles twice, once with the original belt system and once with a modified belt that included one of three aftermarket devices (seat belt extenders, plastic

loops, or shoulder pads). The test vehicles varied in size, belt configurations, and aftermarket devices:

- **Compact vehicle:** The shoulder belt descends from the B-pillar with a shoulder belt adjuster on the B-pillar. The seat belt buckle stalk extends from the seat in proximity to a relatively small center console. The latch plate was able to slide along the lap and shoulder belt. The vehicle had manual seat adjustments and a smaller cabin. A belt extender aftermarket device was used for this vehicle.
- **Mid-size vehicle:** The shoulder belt descends from the B-pillar; in this two-door design the B-pillar is substantially further back than in a four-door design. The seat belt buckle stalk is recessed in the seat alongside a large console that descends to the floor of the vehicle. The latch plate was able to slide along the lap and shoulder belt. The vehicle had both manual and automatic seat adjustments. The plastic loop aftermarket device was used for this vehicle.
- **Full-size vehicle:** In this design, the shoulder belt originates from the retractors attached to the front passenger seats. The seat belt buckle stalk protrudes from the seat in proximity to a medium-sized center console. The latch plate was sewn directly onto the straps of the lap and shoulder belt, making it stationary on the belt and requiring a very specific angle in order to be able to insert the plate into the buckle. A shoulder pad aftermarket device was used for this vehicle.

A comparison of the three base seat belt systems in the two front seating positions showed that, overall, the compact vehicle was rated the most comfortable, easiest to reach with regard to the shoulder belt, and easiest to buckle by the older participants. As for the two-door mid-size vehicle, participants cited a number of specific difficulties with operating the base seat belt system. Most participants had difficulty locating and reaching for the shoulder belt which was affixed to the B-pillar, which is further back. Because the center console in between the two front seats was large and rigid, most participants had difficulty finding and seeing the buckle that was recessed between the seat back and seat cushion. The full-size vehicle seat belt is integrated into the seat back. Many participants had difficulty finding the shoulder belt and needed to twist around to locate it, and then twist again to insert the latch into the buckle. As with

the mid-size vehicle, participants had difficulty finding and seeing the buckle in the full-size vehicle, and felt that the area around the buckle was too narrow. In addition, the design of the latch plate in the full-size vehicle requires positioning it at a very specific angle to the buckle so that it would catch. Many older participants had difficulty finding this angle and voiced their frustrations.

Participants had mixed feelings about the aftermarket devices. When comparing the belt extender and the original system in the compact vehicle, more than half the participants indicated that the presence of the extender improved both the comfort and usability of the seat belt. As for the shoulder pad, some participants felt that it added comfort, but it got in the way when they were trying to operate the system, while others simply mentioned that it was too thick and it did not add any comfort. The plastic loop was found to be helpful for many of the participants in locating, reaching for, and pulling the shoulder belt toward them. However, the plastic loop got in the way when participants tried to buckle or complete other maneuvers. Caution is necessary when interpreting the ratings and perceptions about the aftermarket devices since they were confounded with the vehicle type they were tested in. Each aftermarket device was not tested in each vehicle type.

## Recommendations

There are a number of methods that may be used to increase seat belt use among older adults. In consulting with experts and examining existing data and literature, a number of key research gaps and recommendations for future studies were identified. Improved vehicle designs that will result in higher rates of seat belt use by allowing for more comfortable access and fit should be explored. In addition, research that will examine the seat belt use patterns of older adults or target populations within the older adult community is needed to forecast future scenarios and develop additional programs.

## How to Order

For a copy of *Occupant Protection Issues Among Older Drivers and Passengers* (Vol. 1, Final Report, 66 pages and Vol. 2, Appendices, 145 pages) prepared by Westat, Inc., write to the Office of Behavioral Safety Research, NHTSA, NTI-130, 1200 New Jersey Avenue SE., Washington, DC 20590, or send a fax to 202-366-7394, or download from [www.nhtsa.dot.gov](http://www.nhtsa.dot.gov). Alan Block was the project manager for this study.



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